IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-10. (Canceled)

11. (Currently Amended) A self-pinned abutted junction magnetic read sensor, comprising:

a free layer for sensing magnetic fluxuations;

first hard bias layers abutting the free layer; and

second hard bias layers, formed over the first hard bias layers ~~discontinguous~~ discontiguous from the free layer, ~~the~~ a magnetization of the second hard bias layers being anti-parallel to ~~the~~ a magnetization of the first hard bias layers, the first and second hard bias layers providing a net longitudinal bias on the free layer.

12. (Original) The sensor of claim 11, wherein the first hard bias layers is formed with a thickness substantially equal to a thickness of the second hard bias layers.

13. (Original) The sensor of claim 11, wherein the first hard bias layers is formed with a thickness greater than a thickness of the second hard bias layers.

14. (Original) The sensor of claim 11 further comprising interlayers disposed between the first and second hard bias layers.

15. (Original) The sensor of claim 11 further comprising a self-pinned layer, the self-pinned layer having a first end, a second end and central portion, wherein the central portion is aligned with the free layer and the first hard bias layers are formed over the first and second ends of the self-pinned layer.

16. (Original) The sensor of claim 15 further comprising a spacer layer formed over the self-pinned layer and a first and second seed layer formed between the first and second hard bias layer and the spacer layer.

17. (Original) The sensor of claim 16 further comprising amorphous layers formed between the spacer and the first and second seed layers, the amorphous layer stopping epitaxial growth between the self-pinned layer and the first and second hard bias layers.

18. (Original) The sensor of claim 15 further comprising amorphous layers formed between the self-pinned layer and the first and second hard bias layers for stopping epitaxial growth between the self-pinned layer and the first and second hard bias layers.

19. (Original) The sensor of claim 11 further comprising first and second leads formed over the first and second hard bias layers.

20. (Original) The sensor of claim 11, wherein the free layer further comprises a length selected for a desired track width.

21. (Currently Amended) A magnetic storage system, comprising:

a moveable magnetic storage medium for storing data thereon;

an actuator positionable relative to the moveable magnetic storage medium; and

a magnetoresistive sensor, coupled to the actuator, for reading data from the magnetic recording medium when position to a desired location by the actuator, wherein the magnetoresistive sensor further comprises:

a free layer for sensing magnetic fluxuations;

first hard bias layers abutting the free layer; and

second hard bias layers, formed over the first hard bias layers ~~discontinguous~~ discontiguous from the free layer, ~~the~~ a magnetization of the second hard bias layers being anti-parallel to ~~the~~ a magnetization of the first hard bias layers, the first and second hard bias layers providing a net longitudinal bias on the free layer.

22. (Original) The magnetic storage system of claim 21, wherein the first hard bias layers is formed with a thickness substantially equal to a thickness of the second hard bias layers.

23. (Original) The magnetic storage system of claim 21, wherein the first hard bias layers is formed with a thickness greater than a thickness of the second hard bias layers.

24. (Original) The magnetic storage system of claim 21 further comprising interlayers disposed between the first and second hard bias layers.

25. (Original) The magnetic storage system of claim 21 further comprising a self-pinned layer, the self-pinned layer having a first end, a second end and central portion, wherein the central portion is aligned with the free layer and the first hard bias layers are formed over the first and second ends of the self-pinned layer.

26. (Original) The magnetic storage system of claim 25 further comprising a spacer layer formed over the self-pinned layer and a first and second seed layer formed between the first and second hard bias layer and the spacer layer.

27. (Original) The magnetic storage system of claim 26 further comprising amorphous layers formed between the spacer and the first and second seed layers, the amorphous layer stopping epitaxial growth between the self-pinned layer and the first and second hard bias layers.

28. (Original) The magnetic storage system of claim 25 further comprising amorphous layers formed between the self-pinned layer and the first and second hard bias layers for stopping epitaxial growth between the self-pinned layer and the first and second hard bias layers.

29. (Original) The magnetic storage system of claim 21 further comprising first and second leads formed over the first and second hard bias layers.

30. (Original) The magnetic storage system of claim 21, wherein the free layer further comprises a length selected for a desired track width.

31. (Currently Amended) A self-pinned abutted junction magnetic read sensor, comprising:

first means for sensing magnetic fluxuations;

first bias means abutting the first means on opposite sides of the first means; and

second bias means, formed over the first bias means ~~discontinguous~~ discontiguous from the first means for sensing magnetic fluxuations, ~~the~~ a magnetization of the second bias means being anti-parallel to ~~the~~ a magnetization of the first bias means, the first and second bias means providing a net longitudinal bias on the first means for sensing magnetic fluxuations.

32. (Currently Amended) A magnetic storage system, comprising:

a moveable magnetic storage means for storing data thereon;

an actuator positionable relative to the moveable magnetic storage medium; and

a magnetoresistive sensor, coupled to the actuator, for reading data from the magnetic recording medium when position to a desired location by the actuator, wherein the magnetoresistive sensor further comprises:

first means for sensing magnetic fluxuations;

first bias means abutting the first means on opposite sides of the first means; and

second bias means, formed over the first bias means ~~discontinguous~~ discontiguous from the first means for sensing magnetic fluxuations, ~~the~~ a magnetization of the second bias means being anti-parallel to ~~the~~ a magnetization of the first bias means, the first and second bias means providing a net longitudinal bias on the first means for sensing magnetic fluxuations.